

July 29, 2005

Mr. Michael Gallagher
PBT Coordinator
State of Washington Department of Ecology
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Dear Mr. Gallagher:

The Bromine Science and Environmental Forum (BSEF) submits the following comments on the Department of Ecology's proposed rule regarding Persistent Bioaccumulative Toxins (Chapter 73-333 WAC).

BSEF is a global industry association comprised of the major manufacturers of brominated flame retardants and our mission is to further the scientific understanding of our products.

BSEF's concern with the proposed rule is relatively simple: Decabromodiphenyl ether (Deca-BDE) does not meet the Department of Ecology's criteria for classification as a persistent, bioaccumulative toxin and therefore should not be included in this proposed rule.

Specifically, Deca-BDE does not have a "high potential to bioaccumulate based on evidence that the bioconcentration factor or bioaccumulation factor in aquatic species for the chemical is greater than 1,000." In fact, under the European Union's Risk Assessment, concluded in May 2004 after 10 years of study, Deca-BDE was assigned a measured bioconcentration factor of 41 for fish.¹ Additionally, Deca-BDE was not classified as "toxic" under the EU Risk Assessment.

¹ European Union Risk Assessment Report: Bis(pentabromodiphenyl ether). 1st Priority List, Volume 17. European Commission Joint Research Centre, EUR 20402 EN, 2004: "The available data indicated that little or no uptake of decabromodiphenyl ether occurs in aquatic organisms exposed via the water phase. Some limited uptake had been seen in experiments with fish exposed via food, but the tissue concentrations reached were much lower than those present in the food. Overall it was concluded that the substance can be considered to have a low bioaccumulation potential. A low fish BCF of 4 l/kg was assumed in the assessment."



These facts, as well as numerous other studies, demonstrate that while Deca-BDE is persistent, it is not bioaccumulative or toxic. Additional studies supporting this position include:

- Decabromodiphenyl Ether (DBDPE): “None of the available data give any indication of toxic risk from the levels of exposure envisaged from the use of DBDPE in consumer products. It is very poorly absorbed from the gastrointestinal tract and its low vapour pressure indicates that inhalation exposure is unlikely to be significant. Its tendency to bioaccumulate is low.”²
- “The results of this bioaccumulation study are consistent with previous work showing insignificant bioconcentration of DBDPO in fish, [and] do not provide evidence that DBDPO is debrominated metabolically.”³
- “No human toxicity data were located from oral exposure to DBDPO. In animals, DBDPO has low acute toxicity following oral exposure in part because of its poor gastrointestinal absorption.”⁴
- “In the study juvenile fish (~10 cm) were exposed to 940-950 ng/day of decabromodiphenyl ether via their food for a period of 60 days. This exposure period was followed by a 40 day depuration period. The results showed that little or no accumulation of decabromodiphenyl ether occurred (less than 1% of the total decabromodiphenyl ether administered was accumulated during the study)... The available data also indicate that decabromodiphenyl ether has a relatively short elimination half-life from organisms. This should limit the potential for bioaccumulation of decabromodiphenyl ether.”⁵

Additionally, the proposed rule appears to include Deca-BDE on the basis that it degrades into lower congeners that may meet the PBT profile. In fact, there is no

² G.C. Stevens, A.H. Mann, Risks and Benefits in the Use of Flame Retardants in Consumer Products, a report for the Department of Trade and Industry. Polymer Centre, University of Surrey, January 1999, 29.

³ Voluntary Children’s Chemical Evaluation Program (VCCEP) Data Summary Decabromodiphenyl Ether, CAS # 1163-19-5, American Chemistry Council’s Brominated Flame Retardant Industry Panel (BFRIP), Arlington, VA, December 2002, 52.

⁴ National Research Council, Toxicological Risks of Selected Flame-Retardant Chemicals, National Academy Press, ISBN 0-309-07047-3, 2000, 77.

⁵ European Union Risk Assessment Report: Bis(pentabromodiphenyl ether), European Commission Joint Research Centre, Draft TM IV 2003.



evidence that, in the real world, Deca-BDE degrades or debrominates in any significant manner into lower-brominated PBDE congeners of concern. The pattern of congeners found in the real world environment is characteristic of the congeners present in the commercial Penta-BDE product, which is no longer manufactured or used. Laboratory studies of the degradation of Deca-BDE need to be carefully evaluated as to their relevance in the real world.

Photolytic studies in organic solvents do not result in the pattern of congeners found in the environment. Recent reports of catalytic degradation in sludge also do not result in the pattern of congeners found in the environment. Put more simply, if Deca-BDE was a significant source of the lower-brominated congeners of concern, then we would expect much higher concentrations of particular congeners than are, in fact, found.

Given these facts, we respectfully suggest that including Deca-BDE in this proposed rule is inappropriate and unjustified, and we ask that it be removed.

Sincerely,

A handwritten signature in black ink, reading "Raymond B. Dawson". The signature is written in a cursive, flowing style.

Raymond B. Dawson, PhD.
Chairman
BSEF

A handwritten signature in black ink, reading "David C. Sanders". The signature is written in a cursive, flowing style.

David C. Sanders, PhD.
Director, North America
BSEF